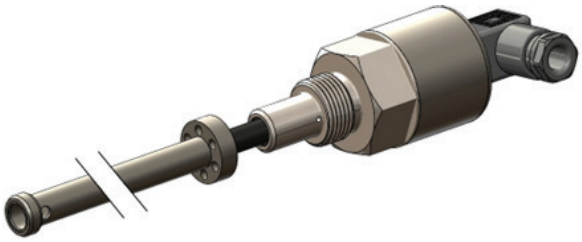
mm

P130

APPLICATION

- Non-contacting inductive technology to eliminate wear
- Travel set to customer's requirement
- Compact and self-contained
- High durability and reliability
- High accuracy and stability
- Sealing to IP65/IP67 as required



As a leading designer and manufacturer of linear, rotary, tilt and intrinsically safe position sensors, Althen has the expertise to supply a sensor to suit a wide variety of applications. Our P130 is an affordable, durable, high-accuracy position sensor designed for demanding hydraulic or pneumatic cylinder position feedback applications where service life, environmental resistance and cost are important. It is particularly suitable for OEMs seeking good sensor performance for arduous applications such as industrial machinery.

Overall performance, repeatability and stability are outstanding over a wide temperature range. The unit is highly compact and space-efficient, being responsive along almost its entire length. Like all Althen sensors it provides a linear output proportional to travel. Each unit is supplied with the output calibrated to the travel required by the customer, any stroke from 0-400mm to 0-1485mm and with full EMC protection built in.

The sensor is very rugged, being made of stainless steel with an inert fluoropolymer-sheathed probe with the option of either an aluminium or stainless steel target tube. The sensor is easy to install in cylinders and has a wide range of mechanical and electrical options. Environmental sealing is to IP65 or IP67 depending on selected cable or connector options.

SPECIFICATIONS

Dimensions[1]	
Body diameter	35 mm
Body Length	43 mm
Probe Length	calibrated travel + 58 mm
Target Tube Length	calibrated travel + 30 mm, Ø9.45 mm
Independent Linearity	≤ ± 0.25% FSO @ 20°C - up to 450 mm ≤ ± 0.5% FSO @ 20°C - up to 600 mm ≤ ± 1% FSO @ 20°C - over 600 mm
Temperature Coefficients	< ± 0.01%/°C Gain & < ± 0.01%FS/°C Offset
Frequency Response	> 10 kHz (-3dB) > 300 Hz (-3dB) 2 wire 4 to 20 mA
Resolution	Infinite
Noise	< 0.02% FSO
Environmental Temperature Limits	
Operating	-40°C to +125°C standard -20°C to +85°C buffered
Storage	-40°C to +125°C
Sealing	IP65/IP67 depending on connector / cable option

05.2025 | version 0001

SPECIFICATIONS (CONTINUED)

Hydraulic Pressure	350Bar
EMC Performance	EN 61000-6-2, EN 61000-6-3
Vibration	IEC 68-2-6: 10 g
Shock	IEC 68-2-29: 40 g
MTBF	350,000 hrs 40°C Gf
Drawing List[2] **P130-11** **P100-15**	 Sensor Outline & Typical Target Installation details Mounting Thread details

[1] *For full mechanical details see drawings P130-11*
[2] *3D models, step or .igs format, available on request*

HOW ALTHEN'S TECHNOLOGY ELIMINATES WEAR FOR LONGER LIFE

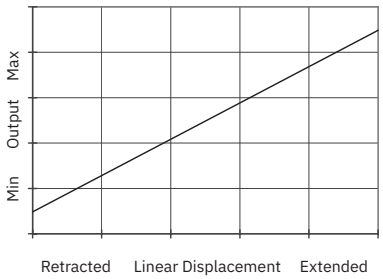
Althen's Inductive technology is a major advance in displacement sensor design. Our displacement transducers have the simplicity of a potentiometer with the life of an LVDT/RVDT.

Our technology combines the best in fundamental inductive principles with advanced micro-electronic integrated circuit technology. An Althen sensor, based on simple inductive coils using Althen's ASIC control technology, directly measures absolute position giving a DC analogue output signal. Because there is no contact between moving electrical components, reliability is high and wear is eliminated for an exceptionally long life.

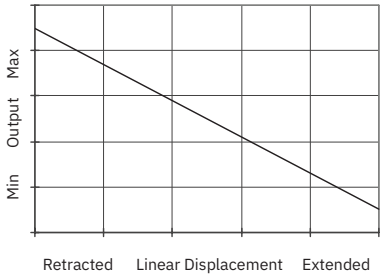
It also overcomes the drawbacks of LVDT technology – bulky coils, poor length-to-stroke ratio and the need for special magnetic materials, no requirement for separate signal conditioning.

We also offer a range of ATEX-qualified intrinsically-safe sensors.

Output Characteristic - Standard



Output Characteristic - Reverse option

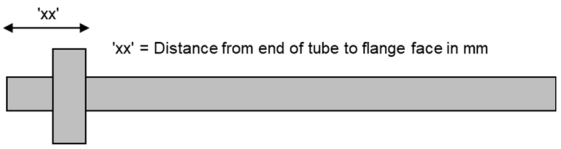


05.2025 | version 0001

P130 .	a	b	c	d	e	f	g
	Displacement	Output	Adjustments	Connections	Option	Option	Z-code

a Displacement		**Value**
Factory set to any length from 0-400 mm to 0-1485 mm (e.g. 0-508 mm)		**508**
b Output		
Supply V_{dc} (tolerance)	**Output**	**Code**
+5V (4.5 - 5.5V)	0.5 - 4.5V (ratiometric with supply)	**A**
Supply Current 10mA typical, 12mA max.		
c Calibration Adjustments		**Code**
Accessible default		**blank**
Sealed		**Y**
d Connections		**Code**
Connector IP65 4 pin (3+earth) DIN 43650 'C'		**J**
Connector IP65 4 pin (3+earth) DIN 43650 'C', pre-wired 3-core cable		**Jxx**
Connector IP65 4 pin (3+earth) DIN 43650 'C', pre-wired 5-core cable		**JQxx**
Cable gland IP67 M12, nylon, 3-core cable		**Lxx**
Cable gland IP67 M12, nylon, 5-core cable		**LQxx**
Cable gland, short† IP67, metal, 3-core cable		**Mxx**
Cable gland, short† IP67, metal, 5-core cable		**MQxx**
Specify required cable length 'xx' in cm. e.g. L2000 specifies axial cable gland with 20 m of cable, 50 cm supplied as standard. †Nb: restricted cable pull strength.		

e Mounting Thread		**Code**
M20 x 1.5		**N**
3/4 16 UNF	Hex. 30 mm A/F, Ø 30 mm seal face. Supplied with O-ring seal.	**P**
M18 x 1.5		**T**
See P100-15 Drawing for Mating Thread Details.		
f Target Tube Mounting Flange		**Code**
Ø19x6 Circlip retained		**Vxx**
Equivalent to MTS 201542 Magnet	Please specify flange position in mm. eg. W17.5 specifies a MTS style flange fitted 17.5 mm from the front face	**Wxx**
See P130-11 Drawing for Target Details.		
g Z-code (optional)		**Code**
IP67 M12 IEC 61076-2-101 conn. No access to cal. Adjustments, must include option 'Y'		**Z600**
IP67 M12 IEC 61076-2-101 conn. with access to cal. adjustments		**Z601**
Tighter Independent Linearity; ≤± xx% FSO @20°C ≤± 0.1% 0 - 450 mm ≤± 0.25% 0 - 451 mm to 0 - 600 mm ≤± 0.5% 0 - 601 mm to 0- 800 mm max.		**Z650**



INSTALLATION INFORMATION

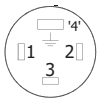
Output Option	Output Description	Supply Voltage: V_s (tolerance)	Load resistance: (include leads for 4 to 20mA O/Ps)
A	0.5 - 4.5V (ratiometric with supply)	+5V (4.5 - 5.5V)	≥ 5kΩ
B	±5V	±15V nom. (±9 - 28V)	≥ 5kΩ
C	0.5 - 9.5V	+24V nom. (13 - 28V)	≥ 5kΩ
D	±10V	±15V nom. (±13.5 - 28V)	≥ 5kΩ
E	4 - 20mA (2 wire Current Loop)	+24V nom. (18 - 28V)	≈ 0 - 300Ω max. @24V ~ 1.2 to 6V across 300Ω {RL max. = (V_s - 18) / 20^{-3}}
F	4 - 20mA (3 wire Sink)	+24V nom. (13 - 28V)	≈ 0 - 950Ω max. @24V ~ 3.8 to 19V across 950Ω {RL max. = (V_s - 5) / 20^{-3}}
G	0.5 - 4.5V	+24V nom. (9 - 28V)	≥ 5kΩ
H	4 - 20mA (3 wire Source)	+24V nom. (13 - 28V)	≈ 0 - 300Ω max. ~ 1.2 to 6V across 300Ω

05.2025 | version 0001

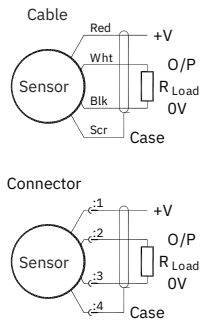
Not all output options available - see product datasheet for full options list

Connector Pinout
(Front View)

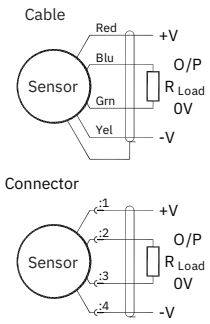
DIN 43650 C



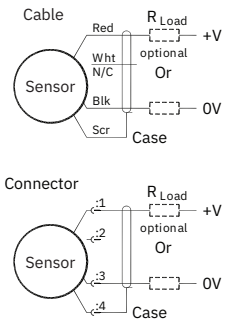
'A', 'C' , 'G' & 'H'



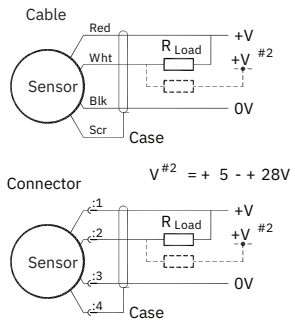
'B' & 'D'



'E'



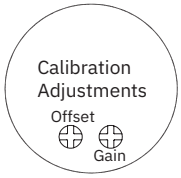
'F'



GAIN AND OFFSET ADJUSTMENT

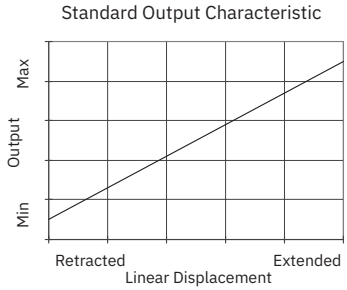
(Where accessible - Typically ± 10% Min available)

To adjust the gain or offset use a small potentiometer adjuster or screwdriver 2mm across. Do not apply too much force on the potentiometers.



OUTPUT CHARACTERISTIC

Target position at start of normal travel is 36.0 mm from seal face. The output increases as the target is moved away from the sensor body, the calibrated stroke is between 400 mm and 1485 mm.

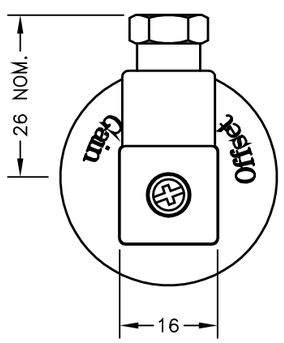


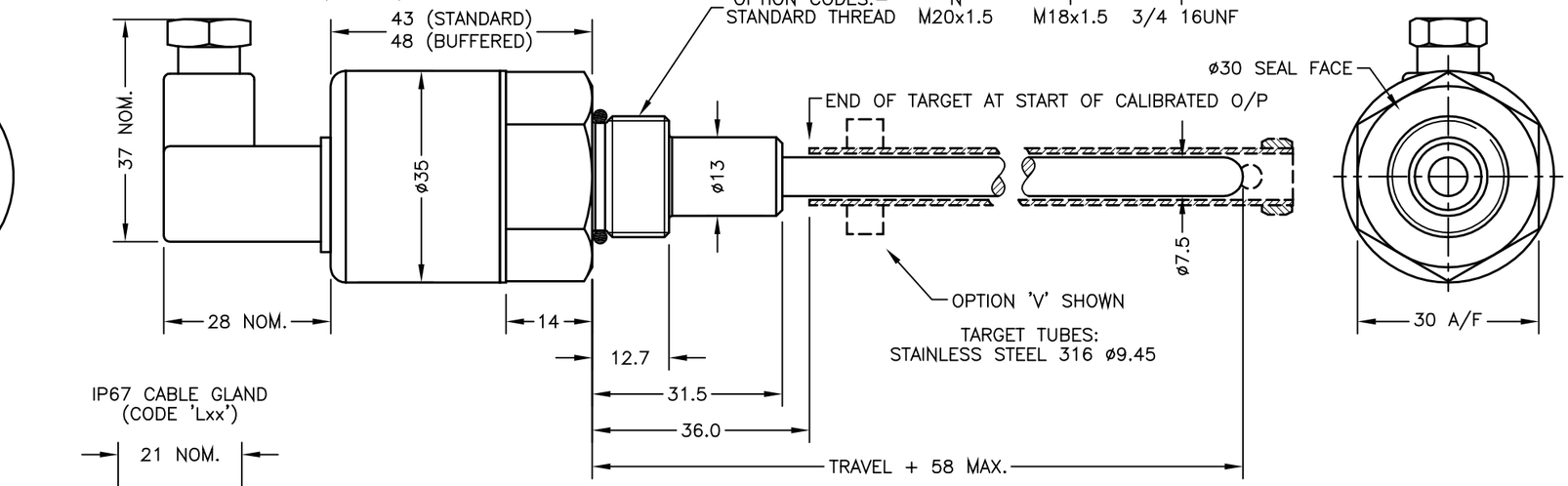
MECHANICAL MOUNTING

Via mounting thread, maximum tightening torque: 100Nm. See drawing P100-15, Installation Details Mounting Threads & Seals. An O ring seal is provided, size BS908 for M20 & 3/4 UNF thread or 14.3 x 2.4 for M18 thread. Install the target tube using the flange provided to fix into the piston rod. **The target tube is intended to have some lateral freedom of movement to allow for misalignments in the assembly.** The end of the target tube can be proud or flush with the piston end face as required - see drawing P130-11. It is assumed that the sensor and target mounting points share a common earth.

INCORRECT CONNECTION PROTECTION LEVELS

A	**Not protected** – the sensor is **not** protected against either reverse polarity or over-voltage. The risk of damage should be minimal where the supply current is limited to less than 50mA.
B & D	Supply leads diode protected. Output must not be taken outside ± 12V.
C & G	Supply leads diode protected. Output must not be taken outside 0 to 12V.
E, F & H	Protected against any misconnection within the rated voltage.





ELECTRICAL OPTIONS/ SPECIFICATIONS

OUTPUT OPTION	OUTPUT	SUPPLY	
A	0.5 TO 4.5V RATIOMETRIC	5V	STANDARD
B	±5V	±15V	BUFFERED
C	0.5 TO 9.5V	24V	BUFFERED
D	±10V	±15V	BUFFERED
G	0.5 TO 4.5V	24V	BUFFERED
	SUPPLY CURRENT 12mA TYP. 20mA MAX.		BUFFERED
E	4 TO 20mA 2–WIRE	24V	BUFFERED
F	4 TO 20mA 3–WIRE SINK	24V	BUFFERED
H	4 TO 20mA 3–WIRE SOURCE	24V	BUFFERED

SINK VERSION OUTPUT COMPLIANCE 5–28V
SOURCE VERSION DRIVE 300Ω MAX TO 0V

CABLE: 0.2mm², O/A SCREEN, PUR JACKET – SUPPLIED WITH 50cm OR REQUIRED LENGTH IN cm. e.g. 'L50'
3–CORE: JACKET ø4mm
4–CORE: JACKET ø4.6mm

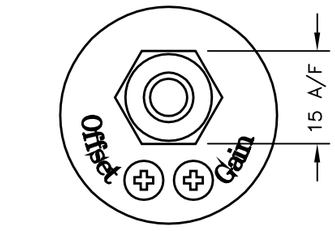
CABLE/CONNECTOR* CONNECTIONS;

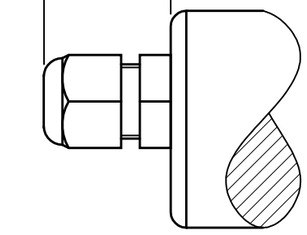
3 CORE	4 CORE	CONNECTOR	
RED	RED	:1	+Ve
BLACK	GREEN	:3	0V
	YELLOW	:4	–Ve – OPTIONS: B OR D
WHITE	BLUE	:2	OUTPUT
SCREEN	SCREEN	:4	BODY – OPTIONS: A, C, E–H

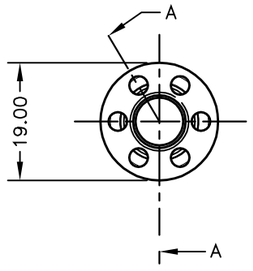
*CONNECTORS; MAXIMUM CONDUCTOR CROSS SECTION 0.75mm²

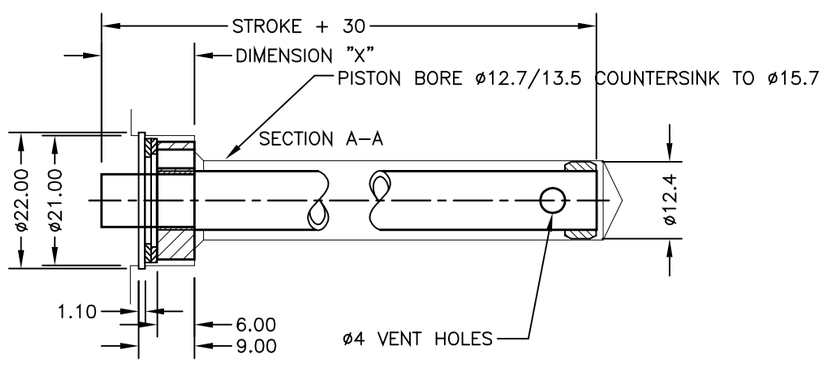
RANGE OF DISPLACEMENT FROM 0–400mm TO 0–1485mm IN INCREMENTS OF 1mm.

BODY MATERIAL: STAINLESS STEEL.



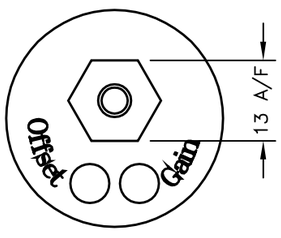




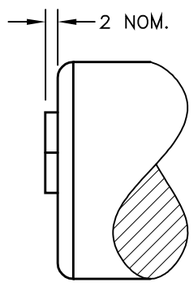


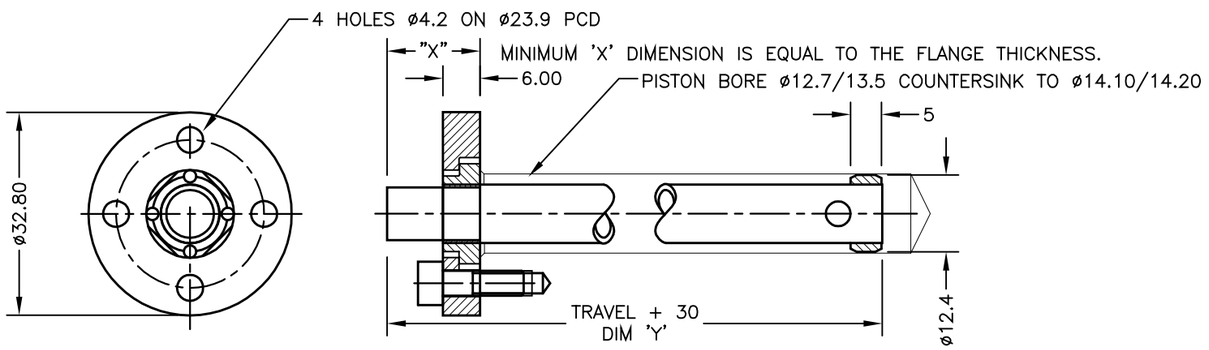
WASHER, WAVY WASHER AND CIRCLIP SUPPLIED
FLANGE OPTION 'V' CIRCLIP FITTING
(ALLOWS ±1 CONCENTRICITY ERRORS)

GAIN AND OFFSET ADJUSTMENTS SEALED (CODE 'Y')



IP67 SHORT CABLE GLAND – AXIAL (CODE 'Mxx')





FLANGE OPTION 'W' SCREW FITTING (EQUIVALENT TO MTS 201542 MAGNET)
(ALLOWS ±0.8 CONCENTRICITY ERRORS)

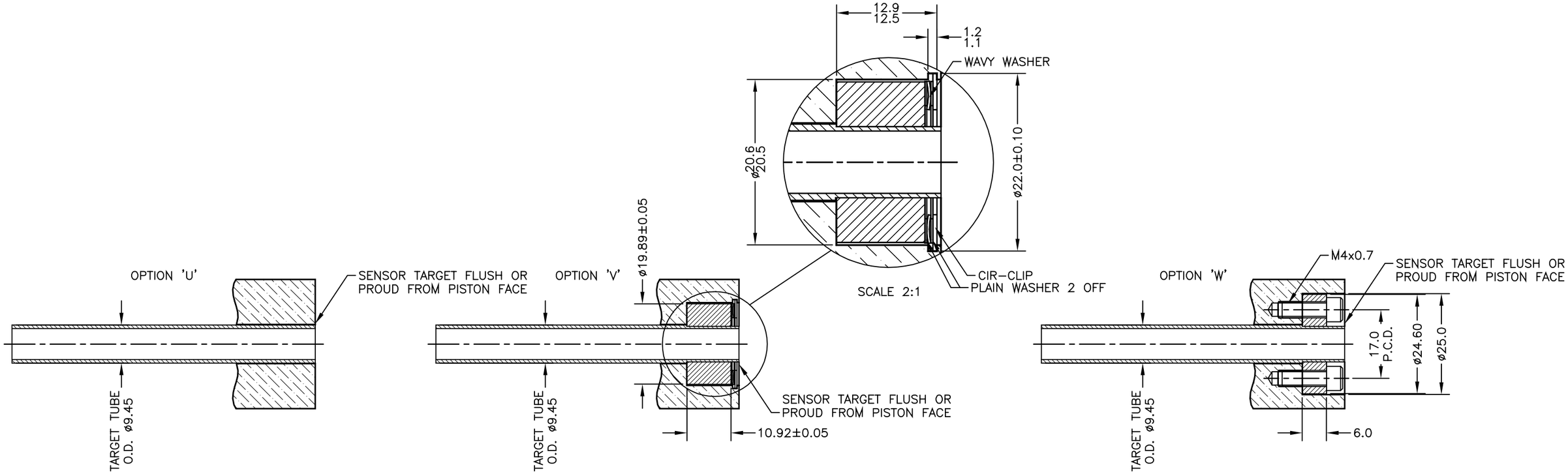
A	FIRST ISSUE	RDS

CE

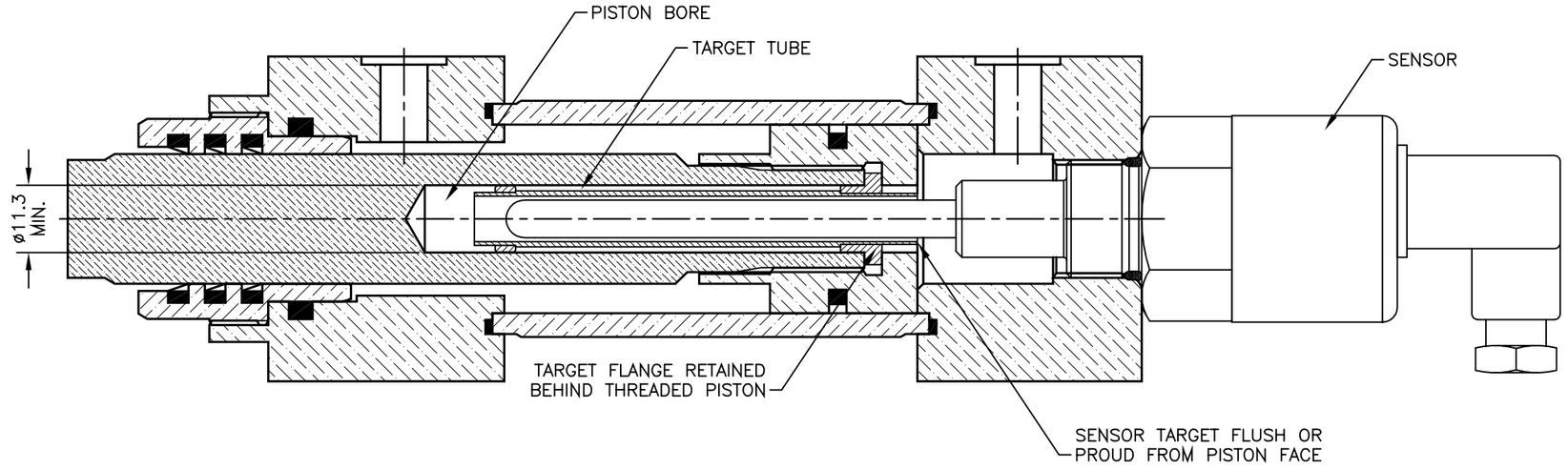
DRAWINGS NOT TO BE CHANGED WITHOUT REFERENCE TO THE CHANGE PROCEDURE.
CHANGES TO PARTS USED IN INTRINSICALLY SAFE PRODUCT MUST BE APPROVED BY THE AUTHORISED PERSON
THIS IS AN UNCONTROLLED PRINT AND WILL NOT BE UPDATED.

A	29/9/18		CHECKED BY	X ±0.4 X.X ±0.2 X.XX ±0.1 DIMS mm
		DESCRIPTION: P130 LIPS LONG STROKE IN-CYLINDER LINEAR POSITION SENSOR		
SCALE 10mm		DRAWING NUMBER P130-11	REV A	SHEET 1 OF 1

SEE DRAWING TG24–11 FOR TARGET TUBE FLANGE OPTIONS 'V', 'W' & 'X'.



OPTION 'X'



A	FIRST ISSUE.	RDS
B	REDRAWN.	PDM
C	WORDING AMMENDED	RDS
D	TARGET NOTES AMENDED - RAN1349	PDM

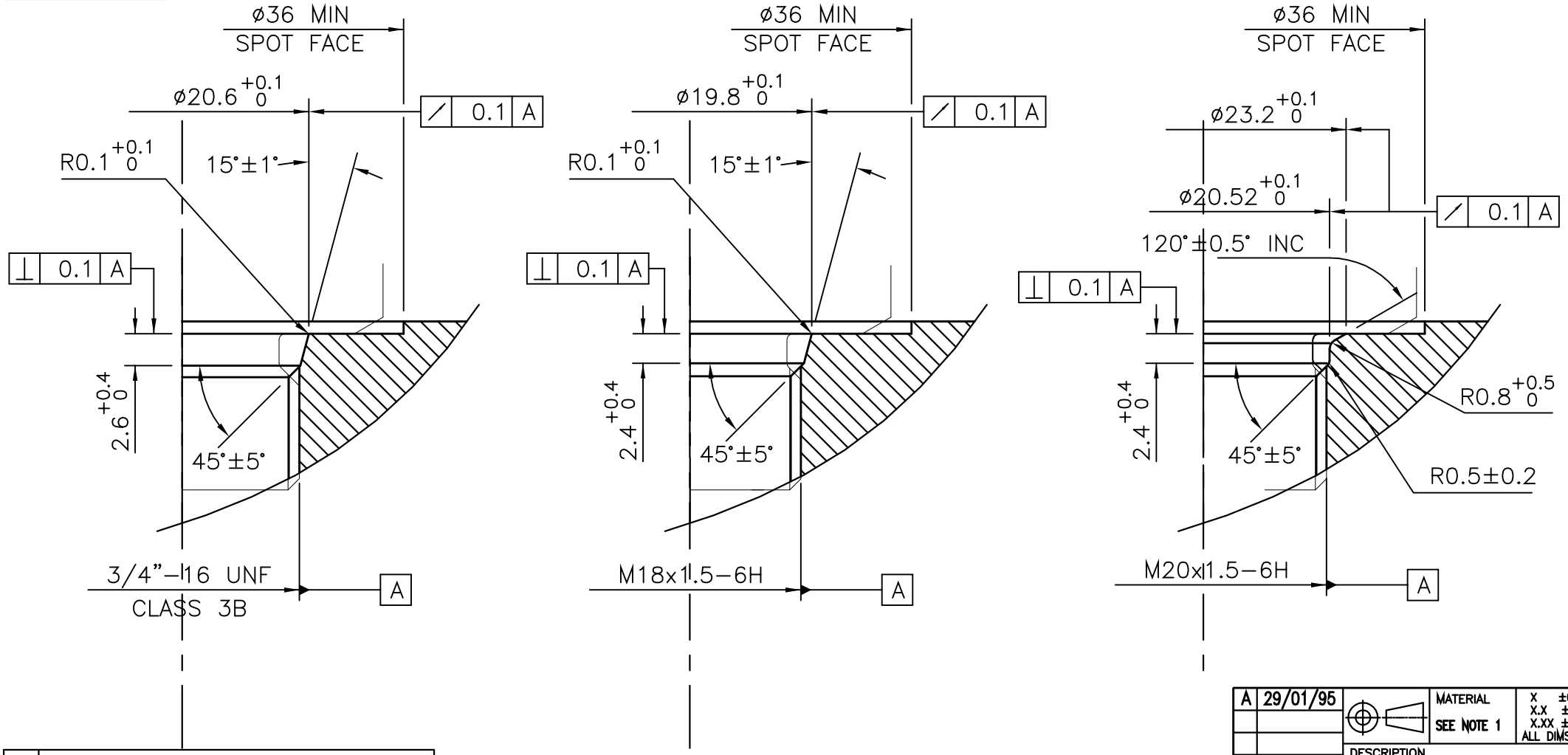
DRAWINGS NOT TO BE CHANGED WITHOUT REFERENCE TO THE CHANGE PROCEDURE.
CHANGES TO PARTS USED IN INTRINSICALLY SAFE PRODUCT MUST BE APPROVED BY THE AUTHORISED PERSON
THIS IS AN UNCONTROLLED PRINT AND WILL NOT BE UPDATED.

A	28/06/95		CHECKED BY	X ±0.4
B	04/10/11		RDM	X.X ±0.2
C	26/10/17			X.XX ±0.1
D	22/01/21			DIMS mm
		DESCRIPTION		
		TYPICAL TARGET TUBE FITTING OPTIONS		
SCALE 10mm		DRAWING NUMBER P100-12		REV D
				SHEET 1 OF 1

CHECKED AT REV. A

RDS

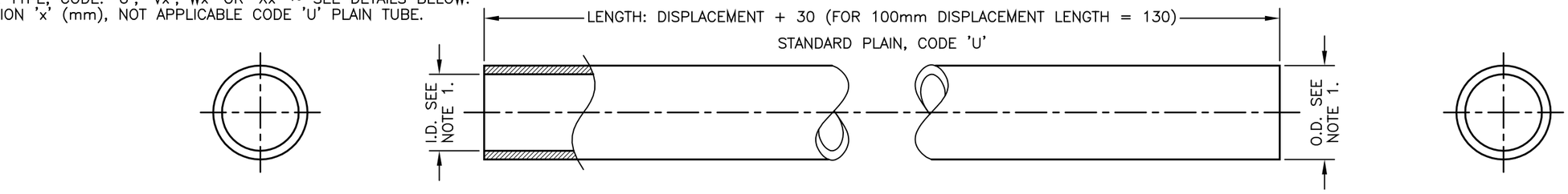
DRAWING NOT TO BE CHANGED WITHOUT REFERENCE TO THE CHANGE PROCEEDURE.
CHANGES TO PARTS USED IN INTRINSICALLY SAFE PRODUCT MUST BE APPROVED
BY THE AUTHORISED PERSON
THIS IS AN UNCONTROLLED PRINT AND WILL NOT BE UPDATED

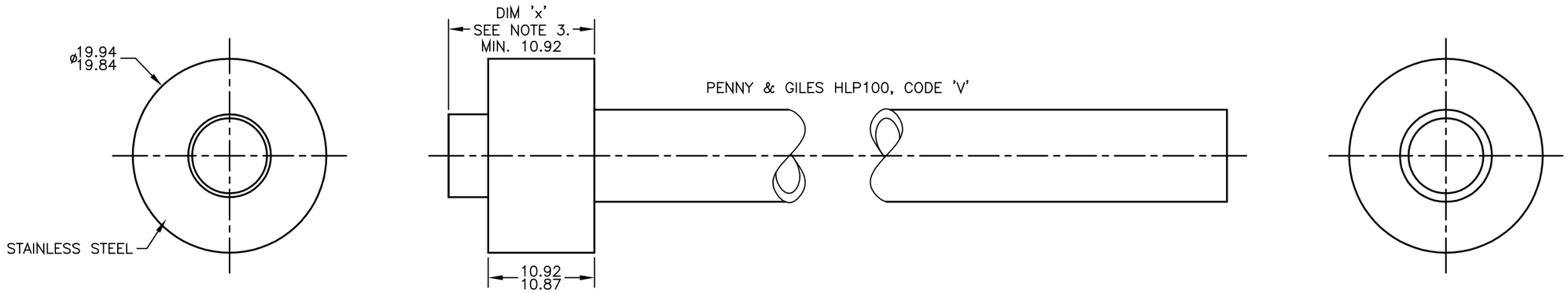


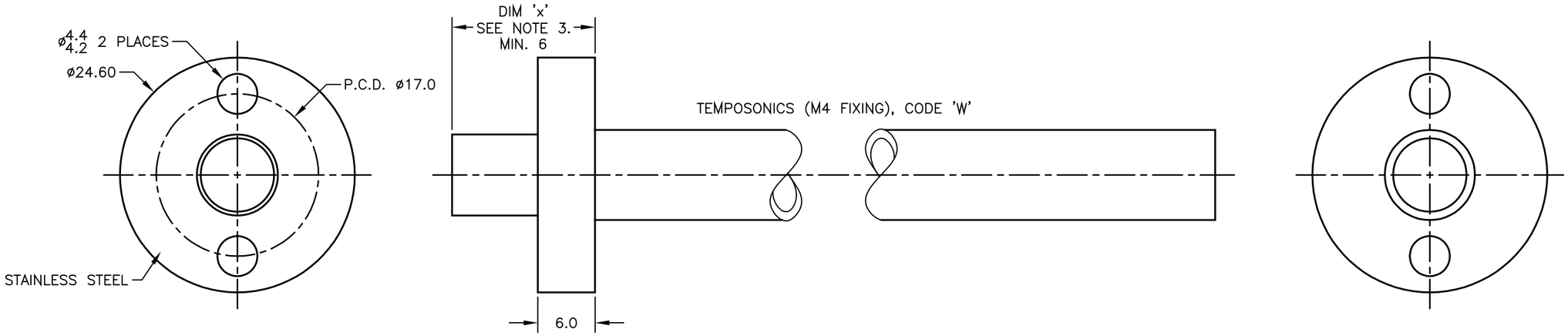
A	FIRST ISSUE	COH/DS

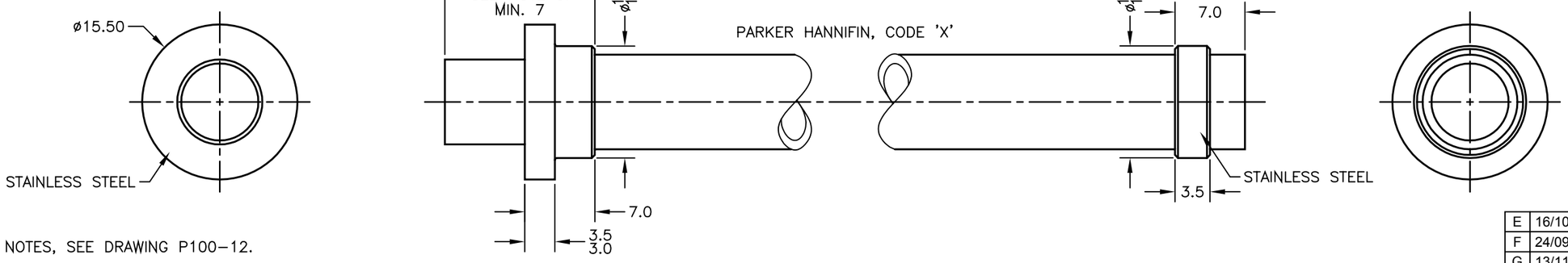
A	29/01/95	MATERIAL SEE NOTE 1	X ±0.4 X.X ±0.2 X.XX ±0.1 ALL DIMS mm
		DESCRIPTION INSTALLATION DETAILS MOUNTING THREADS & SEALS	
		SCALE 5mm	DRAWING NUMBER P100–15 REV A SHEET 1 OF 1

TARGET TUBE OPTION NOTES:–
1. SPECIFY TUBE MATERIAL; CODE:–
   'R' STAINLESS STEEL 316 ø9.45.
   'S' ALUMINIUM 6063 ø3/8" (9.2–9.8). NOTE! ONLY AVAILABLE WITH P100 OR P106 VERSIONS.
2. SPECIFY FLANGE TYPE; CODE: 'U', 'Vx', Wx' OR 'Xx' ~ SEE DETAILS BELOW.
3. SPECIFY DIMENSION 'x' (mm), NOT APPLICABLE CODE 'U' PLAIN TUBE.









TARGET TUBE MOUNTING NOTES, SEE DRAWING P100–12.

E	MATERIAL OPTION REMOVED.	PDM
F	MAT'L OPTION REINSTATED RAN221.	PDM
G	X DIM FOR PH FLANGE SHOWN RAN225	RDS
H	9.45 WAS 9.5 RAN396	RDS
J	REDRAWN, PH FLANGE ROTATED RAN507.	PDM
K	NOTE 1 AMENDED ~ RAN1114.	PDM
L	'x' WAS 'n' ~ RAN1309	PDM

E	16/10/06		CHECKED BY	X ±0.4
F	24/09/08		RDM	X.X ±0.2
G	13/11/08			X.XX ±0.1
H	11/12/12			DIMS mm
J	23/07/14	DESCRIPTION		
K	30/11/16	TARGET TUBE AND FLANGE OPTIONS (LIPS 100/106)		
L	08/11/22			
SCALE 5mm		DRAWING NUMBER	TG24-11	REV L
				SHEET 1 OF 1